

**Citation:**

Marshall SJ, Biddle SJ, Gorely T, Cameron N, Murdey I. Relationships between media use, body fatness and physical activity in children and youth: A meta-analysis. *Int J Obes Relat Metab Disord*. 2004 Oct; 28(10): 1,238-1,246. Review.

**PubMed ID:** [15314635](#)

**Study Design:**

Meta-analysis

**Class:**

M - [Click here](#) for explanation of classification scheme.

**Research Design and Implementation Rating:**

POSITIVE: See Research Design and Implementation Criteria Checklist below.

**Research Purpose:**

To review evidence of associations between television (TV) viewing, video/computer game use and body fatness and physical activity.

**Inclusion Criteria:**

- Published on or after 1985 for studies related to sedentary behavior and body fatness
- Study subjects less than 18 years of age
- Published in English
- Published in a peer-reviewed journal.

**Exclusion Criteria:**

Not applicable.

**Description of Study Protocol:****Recruitment**

- Searches of the following computerized databases were conducted:
  - PsychInfo
  - SportDiscus
  - Medline (Pubmed)
  - Ingenta
- Key words for these searches were:
  - Physical activity
  - Sedentary behavior
  - Inactivity
  - Television

- Computer, video, body composition
- Fatness
- Obesity
- Overweight
- Youth
- Adolescence
- In addition, reference sections of narrative reviews and primary studies located from the previous searches were conducted
- Finally, a manual search of reprint files held by the Sedentary Behavior Research Group at Loughborough University was conducted.

## Design

Systematic review and meta-analysis.

## Statistical Analysis

- Data were extracted by one reviewer using a structured form and were checked for accuracy by a second reviewer
- All analyses were conducted using the Pearson correlation coefficient effect size with the adjustment computations proposed by Hunter and Schmidt
- Where data other than Pearson coefficients were presented in primary studies, standard transformations were applied to estimate the Pearson correlation
- Where primary studies only presented P-values and sample sizes, the maximum possible Pearson correlation was computed
- The present study also corrected for four main study artifacts: Sampling error, measurement error in the independent variable, measurement error in the dependent variable and dichotomization of a continuous dependent variable
- For each sample-weighted and corrected mean correlation, 95% credibility and confidence intervals were computed
- The homogeneity of mean corrected effect size was examined to determine if the variability in outcomes was greater than expected from sample error and measurement artifacts. In addition to credibility intervals, homogeneity of effects was examined using the Q-statistic and the 75% rule.

## Data Collection Summary:

- *Dependent variables:* Body fatness
- *Independent variables:*
  - TV viewing
  - Sedentary behaviors
  - Physical activity.

## Description of Actual Data Sample:

- *Initial N:* 39

- *Attrition (final N):*
  - N=30 studies, with a total of 44,707 subjects were studied with body fatness as the dependent variable
  - N=24 studies, with a total of 143,235 subjects were studied with physical activity as the dependent variable
- *Age:*
  - 46% of samples were seven to 12 years of age, with the remained being under seven years (8%), 13 to 18 years (23%) or a combination of ages (23%) for body fatness
  - For physical activity, 39% of the samples were 13 to 18 years, 22% were seven to 12 years, 7% were under seven years and 32% were a combination of ages
- *Other relevant demographics:*
  - For body fatness, the majority of samples were single-sex, 42% were girl-only, 29% were boy-only and 29% included boys and girls
  - Only one study was published prior to 1990, eight were published between 1990 and 1995 and 21 were published after 1995
  - For physical activity, 41% were girl-only, 32% were boy-only and 27% included boys and girls
- *Location:*
  - United States, Canada, Belgium, Japan, Australia, China, France, Germany, Mexico and the United Kingdom for body fatness
  - United States, Canada, pan-Europe, Belgium, Hong Kong, Germany, Iceland, Norway, South Africa and Spain for physical activity.

## Summary of Results:

### TV Viewing, Video/Computer Game Use and Body Fatness

- The sample-weighted effect size between TV viewing and body fatness was 0.066 (95% CI=0.056 to 0.078). The sample-weighted fully corrected effect size was 0.084
- While this relationship was statistically significant ( $P<0.05$ ), the fact that 99% of the variance in body fatness may be explained by factors other than TV viewing calls into question the clinical relevance of the TV viewing and body fatness relationship
- The sample-weighted effect size between video/computer game use and body fatness was 0.070 (95% CI=-0.048 to 0.188). The sample weighted fully corrected effect size was 0.128
- The 95% CI for the sample-weighted effect size suggests that the relationship in the population is probably non-significant.

### TV Viewing, Video/Computer Game Use and Physical Activity

- The sample-weighted effect size between TV viewing and physical activity was -0.096 (95% CI=-0.080 to -0.112). The sample-weighted fully corrected effect size was -0.129
- A statistically significant negative effect provides evidence for a displacement hypothesis
- The sample-weighted effect size between video/computer game use and physical activity was -0.104 (95% CI=-0.080 to -0.128). The sample weighted fully corrected effect size was 0.141
- This suggests that the relationship is best described as small.

## Author Conclusion:

## Reviewer Comments:

- A statistically significant relationship exists between TV viewing and body fatness among children and youth, although it is likely to be too small to be of substantial clinical relevance
- The relationship between TV viewing and physical activity is small but negative.

## Research Design and Implementation Criteria Checklist: Review Articles

### Relevance Questions

- |    |   |     |
|----|---|-----|
| 1. | Will the answer if true, have a direct bearing on the health of patients?                       | Yes |
| 2. | Is the outcome or topic something that patients/clients/population groups would care about?     | Yes |
| 3. | Is the problem addressed in the review one that is relevant to nutrition or dietetics practice? | Yes |
| 4. | Will the information, if true, require a change in practice?                                    | Yes |

### Validity Questions

- |     |  |     |
|-----|--|-----|
| 1.  | Was the question for the review clearly focused and appropriate?   | Yes |
| 2.  | Was the search strategy used to locate relevant studies comprehensive? Were the databases searched and the search terms used described?  | Yes |
| 3.  | Were explicit methods used to select studies to include in the review? Were inclusion/exclusion criteria specified and appropriate? Were selection methods unbiased?   | Yes |
| 4.  | Was there an appraisal of the quality and validity of studies included in the review? Were appraisal methods specified, appropriate, and reproducible?   | No  |
| 5.  | Were specific treatments/interventions/exposures described? Were treatments similar enough to be combined?   | Yes |
| 6.  | Was the outcome of interest clearly indicated? Were other potential harms and benefits considered?   | Yes |
| 7.  | Were processes for data abstraction, synthesis, and analysis described? Were they applied consistently across studies and groups? Was there appropriate use of qualitative and/or quantitative synthesis? Was variation in findings among studies analyzed? Were heterogeneity issues considered? If data from studies were aggregated for meta-analysis, was the procedure described? | Yes |
| 8.  | Are the results clearly presented in narrative and/or quantitative terms? If summary statistics are used, are levels of significance and/or confidence intervals included?   | Yes |
| 9.  | Are conclusions supported by results with biases and limitations taken into consideration? Are limitations of the review identified and discussed?   | Yes |
| 10. | Was bias due to the review's funding or sponsorship unlikely?  | Yes |

